

Claims

1. A method for removing sodium oxalate from a Bayer liquor, the method comprising removing a stream of the  
5 liquor, treating it to be supersaturated with sodium oxalate, and then subjecting it to ultrasonic irradiation, and removing resultant crystals.
2. A method as claimed in claim 1 wherein the stream of  
10 the supersaturated liquor is subjected to ultrasonic irradiation for a time no more than 30 seconds, more preferably no more than 10 seconds, for example 2 seconds or 3 seconds.
- 15 3. A method as claimed in claim 2 wherein the stream is caused to flow through a duct, and the contents of the duct are continuously subjected to ultrasonic irradiation.
- 20 4. A method as claimed in claim 3 wherein the ultrasound is applied using a multiplicity of ultrasonic transducers attached to a wall of the duct in an array of separate transducers extending both circumferentially and  
longitudinally, each transducer being connected to a  
25 signal generator so that the transducer radiates no more than  $3 \text{ W/cm}^2$ , the transducers being sufficiently close together and the number of transducers being sufficiently high that the power dissipation within the vessel is between 25 and 150 W/litre.
- 30 5. A method as claimed in claim 4 wherein the duct is of width at least 0.10 m.
6. A method as claimed in any one of the preceding  
35 claims wherein the Bayer liquor is first treated by

evaporation so that it becomes supersaturated with sodium oxalate.

7. A method as claimed in any one of the preceding  
5 claims wherein the crystals resulting from ultrasonic irradiation are contacted with liquor that is supersaturated with sodium oxalate so the crystals grow, before removing resultant crystals.

10 8. A method as claimed in any one of the preceding claims wherein a stream of liquid that is supersaturated in sodium oxalate and which contains crystals of sodium oxalate is subjected to ultrasonic irradiation, to cause more crystal growth.

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9. An apparatus for removing sodium oxalate from a Bayer liquor, the apparatus comprising means to make a stream of the liquor supersaturated with sodium oxalate, means to subject supersaturated liquor to ultrasonic  
20 irradiation, and means to remove the resultant crystals.

10. An apparatus as claimed in claim 9 wherein the ultrasonic irradiation means comprises a duct with a multiplicity of ultrasonic transducers attached to a wall  
25 of the duct in an array of separate transducers extending both circumferentially and longitudinally, each transducer being connected to a signal generator arranged such that the transducer radiates no more than  $3 \text{ W/cm}^2$ , the number and the proximity of the transducers being  
30 sufficient that the power dissipation within the vessel in use is between 25 and 150 W/litre.

11. An apparatus as claimed in claim 9 or claim 10 also comprising a vessel in which supersaturated liquor is  
35 combined with the liquor that has been subjected to

ultrasonic irradiation, before removal of any resultant crystals.

12. An apparatus as claimed in claim 9, claim 10 or  
5 claim 11 also comprising means to subject a stream of liquid that is supersaturated in sodium oxalate and which contains crystals of sodium oxalate to ultrasonic irradiation, to cause more crystal growth.